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EXAMINER	
KENNEDY, TIMOTHY J	

ART UNIT	PAPER NUMBER
1791	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/595,915	JOHNSON, GREGORY BALFOUR	
	Examiner	Art Unit	
	TIMOTHY KENNEDY	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/14/2006 and 5/19/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-5, 8, 10-19, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davidovits et al (U.S. Patent 4,509,985: Already of Record), in view of Silverstrim et al (U.S. Patent 5,601,643: Already of Record). Regarding claim 1, Davidovits et al teach:

4. Forming a geopolymer concrete composition comprising a mixture of an alumino silicate component, an alkali or alkaline earth metal silicate component, an alkali or alkaline earth metal hydroxide, aggregate and water (Davidovits et al in Example I (column 4, lines 60-69—column 5, lines 1-34) teaches using all the above ingredients. In Example I the alkali metal is potassium, and the aggregate is sand)

5. Casting the concrete into a mold; and subjecting the molded concrete to consolidation in the mold (Davidovits et al in Example I (column 5, lines 17-18) teach casting the mixture into a mold and curing the mixture in the mold)

6. Davidovits et al do not teach:

7. The weight ratio of SiO_2 to M_2O wherein M is an alkali metal is in the range of from 0.8 to 1.2

8. Davidovits et al teach that the SiO_2 to M_2O ratio when converted to a weight ratio is 2.01 to 4.48 (column 1, Table A)

9. In the same field of endeavor Silverstrim et al teach a SiO_2 to M_2O weight ratio of 0.2 to 0.75 (Abstract)

10. Davidovits et al and Silverstrim et al do not disclose the exact weight ratio. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a weight ratio between 0.8 and 1.2, since it has been held that when multiple prior art sources teach ranges above and below that which is claimed, it plainly suggests to one skilled in the art to look to the ranges appearing in the prior art. In addition, when claimed subject matter falls within the "range" of the prior art, it is presumed obvious. *Iron Grip Barbell Co., Inc. v. USA Sports, Inc., 392 F.3d 1317, 1322, 73 USPQ2d 1225, 1228 (Fed Cir. 2004).* Also it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to use the claimed weight ratio so that the workability could be controlled. *In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235.*

11. Further regarding claim 1:

12. Wherein the water content is insufficient to provide a slumped concrete

13. Davidovits et al and Silverstrim et al do not disclose that their amount of water would create a no slump concrete. It would have been obvious to one having ordinary

skill in the art at the time the invention was made to add enough water to make the concrete no slump, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. One would have been motivated to make the concrete no slump to improve the workability and expand the usage of the concrete. *In re Boesch F.2d 272, 205 USPQ 215 (CCPA 1980).*

14. Regarding claim 2, Davidovits et al further teach:

15. Metal M is at least one of sodium and potassium (column 4, lines 39-40)

16. Regarding claims 3-5, for reasons previously stated, Davidovits et al and Silverstrim et al teach:

17. Claim 3) The ratio of SiO_2 to M_2O is at least 0.9

18. Claim 4) The ratio of SiO_2 to M_2O is at least 0.95

19. Claim 5) Wherein M_2O is Na_2O and the ratio of SiO_2/Na_2O is in the range of 0.9 to 1.2

20. Regarding claim 8, both Davidovits et al and Silverstrim et al teach:

21. A method according to claim 1 used in the molding of concrete products (Davidovits et al: column 1, lines 5-7 and Silverstrim et al: lines 60-65)

22. Regarding claims 10 and 11, Davidovits et al do not teach:

23. Claim 10) The aluminosilicate material is selected from the group consisting of fly ash, ground blast furnace slag, metakaolin, silica fume, synthetic aluminosilicate, scoria and pumice.

24. Claim 11) At least 70% by weight of the aluminosilicate binder component is fly ash.

25. In the same field of endeavor Silverstrim et al teach the use of 21.10% fly ash (which is 100% of the aluminosilicate) (column 8, Table 3)

26. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use fly ash as taught by Silverstrim et al, using the Davidovits et al method, since fly ash presents environmental concerns and this would be a means of recycling the fly ash.

27. Regarding claim 12, Davidovits et al furhter teach:

28. The aluminosilicate component further comprises an aluminosilicate selected from the group consisting of ground granulated blast furnace slag and Portland cement (Davidovits teaches both slag and Portland cement: column 3, lines 7-38)

29. Regarding claim 13, Davidovits et al and SIlverstrim et al for the reasons stated previously, teach:

30. The aluminosilicate component comprises at least 70% by weight of fly ash, blast furnace slag in an amount of up to 30% by weight and wherein the composition further comprises ordinary Portland cement in an amount of up to 8% by weight of the total weight of the aluminosilicate binder component.

31. The combination of Davidovits et al and Silverstrim et al teach the aluminosilcates fly ash, blast furnace slag, and Portland cement, but are silent to the percent of each in the aluminosilicate. This is seen as a result effective variable since the addition of each component alters the chemistry of the mix and the speed at which the workability changes. Since it has been held that discovering an optimum value of a

result effective variable involves only routine skill in the art. *In re Boesch F.2d 272, 205 USPQ 215 (CCPA 1980).*

32. Regarding claim 14, Siliverstrim et al, for the reasons stated previously, teach:

33. Comprising the following components by weight of the total weight of dry components as follows:

34. 40 to 60% course aggregate

35. 20 to 45% sand

36. 10 to 20% fly ash

37. 0.5 to 2% sodium silicate

38. 0.2 to 0.6% sodium hydroxide

39. Silverstrim et al teach (column 8, Table 3), when converted to percentage of dry ingredients:

40. 44.09% coarse aggregate

41. 27.05% fine aggregate (Examiner is interpreting this to mean sand)

42. 21.56% fly ash

43. 3.51% sodium silicate

44. 3.78% sodium hydroxide

45. Silverstrim et al and Davidovits et al disclose the claimed invention except for discrepancies in the percentage of the fly ash, sodium silicate, and sodium hydroxide. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use 10 to 20% fly ash, 0.5 to 2% sodium silicate, and 0.2 to 0.6% sodium hydroxide, since it has been held that where the general conditions of a claim are

disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to use the given percentages, since these ingredients can alter the workability of the concrete, so depending on what the concrete will be used for will determine those percentages.

46. Regarding claim 15, Davidovits et al and Silverstrim et al, for the reasons stated previously, teach:

47. Wherein from half to two thirds of the total water content of the concrete having a water content insufficient to provide a slumped concrete is added to the composition following mixing of the metal hydroxide component and at least part of the aggregate and optionally other components.

48. Silverstrim et al teach mixing fly ash, sodium hydroxide, and sodium silicate (Table 1), and then mixing in the water and aggregate together (column 8, lines 13-22). Silverstrim et al adds 100% of the water to the mixture as shown in Table 3, and as previously stated regarding claim 1, the amount of water to create a no slump concrete has been discussed.

49. Davidovits et al and Silverstrim et al disclose the claimed invention except the mixing order. It would have been obvious to one having ordinary skill in the art at the time the invention was made to reorder the mixing steps as taught by Silverstrim et al to those of the instant application, since it has been held that selection of any order of mixing ingredients is prima facie obvious. One would have been motivated to using the mixing order as taught in the instant applications to have a better control over the

consistency of the concrete by controlling the amount of water. *In re Gibson, 39 F.2d, 975, 5 USPQ 230 (CCPA 1930)*

50. Regarding claim 16, Davidovits et al and Silverstrim et al, for the reasons stated previously regarding claim 15, teach:

51. Wherein forming the geopolymer concrete includes the steps of forming a mixture of at least part of the aggregate component with the metal hydroxide and combining the mixture of metal hydroxide and at least part of the aggregate with a binder comprising aluminosilicate material and an activator comprising metal silicate

52. Regarding claims 17:

53. Wherein at least 50% of the total aggregate component is present in the mixture with the aggregate and metal hydroxide.

54. Davidovits et al and Silverstrim et al disclose the claimed invention, as previously discussed regarding the order of mixing components in claim 16, except for the percentage of the aggregate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have at least 50% of the aggregate present, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. One would have been motivated to do so, so that the sodium hydroxide is coating the aggregate which will create a stronger bond between the aggregate and the binder when the reaction between the hydroxide and silicate occurs. *In re Boesch F.2d 272, 205 USPQ 215 (CCPA 1980).*

55. Regarding claim 18:

56. Wherein the aggregate mixed with the metal hydroxide has a water content of less than 0.8% of the total mass of components.

57. Davidovits et al and Silverstrim et al disclose the claimed invention except the amount of water present. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have less than 0.8% water, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. One would have been motivated to have that amount of water so that the concrete was no slump, thus improving the workability and expanding the usage of the concrete. *In re Boesch F.2d 272, 205 USPQ 215 (CCPA 1980).*

58. Regarding claim 19, Davidovits et al further teaches:

59. Wherein the geopolymer concrete composition is case into a mold and compacted into the mold (column 5, lines 17-18)

60. Regarding claim 22:

61. Wherein the geopolymer concrete is a no slump concrete.

62. Refer to the discussion of claim 1 in regards to the geopolymer concrete being a no-slump concrete

63. Regarding claim 23, Silverstrim et al, for the reason stated previously, teach:

64. Wherein the ratio of sand to stone in the composition is in the range of from 1:1.5 to 1:2

65. In Table 3 (column 8), the ratio of fine aggregate (I.e. sand) to course aggregate is 1:1.63.

66. Regarding claim 24, Davidovits et al and Silverstrim et al, for the reasons stated previously, teach:

67. Wherein water is present in the mixture of at least part of the aggregate component and metal hydroxide and further water is added with the remaining components and wherein the ratio of water present in the mixture of at least part of the aggregate component and metal hydroxide to the water added with the remaining components is in the range of from 1:2 to 1:3.

68. Silverstrim et al states that the sodium hydroxide solution is 75% water (column 10, lines 26-27) and that water is added to the complete composition Table 3. But is silent to the ratio of the water additions.

69. Davidovits et al and Silverstrim et al disclose the claimed invention except the amount of water present. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the water ration of 1:2 to 1:3, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. One would have been motivated to have that amount of water so that the concrete was no slump, thus improving the workability and expanding the usage of the concrete. *In re Boesch F.2d 272, 205 USPQ 215 (CCPA 1980).*

70. Claims 6 and7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davidovits et al, in view of Silverstrim et al, as evidenced by Helgesson (U.S. Patent 4,144,086)

71. Regarding claims 6 and 7:

72. Claim 6) At 15 minutes after mixing the concrete has a Vebe time in the range of from 15 to 40 seconds.

73. Claim 7) At 30 minutes the concrete has a Vebe time in the range of 15 to 50 seconds and at 45 minutes the concrete has a Vebe time of from 15 to 60 seconds.

74. The Vebe time is a result effective variable based on the composition of the concrete being tested. As evidenced by Helgesson, the Vebe time can vary greatly depending on composition (column 3, lines 15-49). The composition and concrete as taught by the combination of Dvidovits et al and Silverstrim et al would have a Vebe time in the given range depending on the amount of water added to the mixture. It would have been obvious to one having ordinary skill in the art at the time the invention was made to add enough water to make the concrete no slump, which is what the claimed Vebe times are used to determine, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. One would have been motivated to make the concrete no slump to improve the workability and expand the usage of the concrete. *In re Boesch F.2d 272, 205 USPQ 215 (CCPA 1980).*

75. Claims 9, 20, 21, 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davidovits et la and Silverstrim et al as applied to claim 1 above, and further in view of Fenske et al (U.S. PreGrant Publication 2003/0056696). Regarding claim 9, Davidovits et al and Silverstrim et al do not teach:

76. A method according the claim 1 used in the formation of molded pipe by methods selected from the group consisting of centrifugal processes, roller suspension process and vertical casting processes.

77. In the same field of endeavor Fenske et al teach the use of a polymer concrete in the production of pipes using centrifugal casting (paragraph 0040).

78. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the pipe making process as taught by Fenske et al, using the geopolymer concrete of Davidovits et al and Silverstrim et al, since it is a very common method of making pipes which reduces casting and curing times.

79. Regarding claims 20, 21, 26 and 27 see arguments used above for claim 9

80. Regarding claim 25:

81. A concrete pipe produced by the method according to claim 16.

82. The combination of Davidovits et al, Silverstrim et al, and Fenske et al as laid out regarding claim 9, one having ordinary skill in the art at the time the invention was made would have been able to produced a pipe using there combined methods.

Conclusion

83. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

84. U.S. Patent 3,892,704: Casting polymer concretes

85. U.S. Patent 4,461,644: SiO_2 to M_2O ratio

86. U.S. Patent 6,296,699: SiO_2 to M_2O ratio

87. U.S. Patent 6,409,819: Slag and fly ash

88. Hardjito et al (Already of Record): similar method with use of fly ash

89. U.S. PreGrant Publication 2003/0188669: Slag and fly ash

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TIMOTHY KENNEDY whose telephone number is (571) 270-7068. The examiner can normally be reached on Monday to Friday 9:00am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Del Sole can be reached on (571) 272-1130. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

tjk

/Joseph S. Del Sole/

Supervisory Patent Examiner, Art Unit 1791